Chapter 19
## MEASURING VALUE CREATION

Separating the wheat from the chaff

Creating value has become such an important issue in finance that a host of indicators have been developed to measure it. They come under a confusing array of acronyms – TSR, MVA, EVA, CFROI, ROCE-WACC – but most of these will probably be winnowed out in the years to come. Ultimately, they should be reduced to those few that best mirror and address the recent developments in cash flow statements.

The current profusion of indicators has its advantages, as normally we expect only the most reliable to survive. However, in practice some companies use the lack of clear guidelines and standards to choose indicators that best serve their interests at a given time, even if this involves the laborious task of changing indicators on a routine basis.

The table below should help you find your way through the maze of indicators. It charts the chronological appearance of value measures according to three criteria: ease of manipulation, sensitivity to financial markets and category (accounting, economic or stock market indicators).

EVOLUTION OF FINANCIAL INDICATORS

Accounting, economic and stock market criteria

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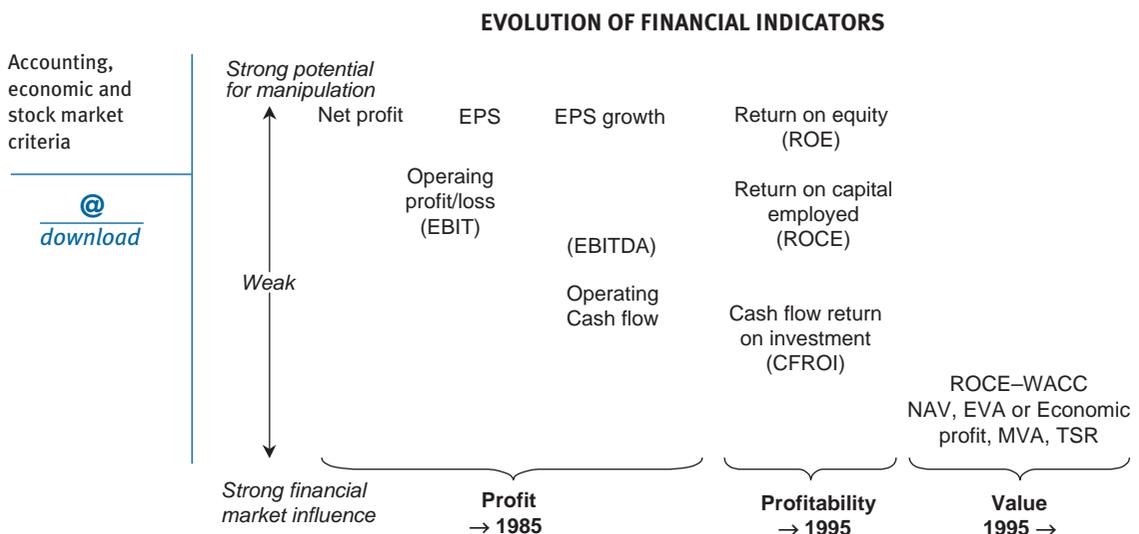
Predictably, the indicators cluster around a diagonal running from the upper left-hand corner down to the lower-right hand: this reflects the companies' diminished ability to manipulate the indicators over time. Gradually, investors become more experienced and financial markets become more influential, and therefore are less prone to misinterpreting company data.

Value creation indicators fall into three categories:

➤ **Accounting indicators.** Until the mid-1980s, companies mainly communicated their **net profit/loss** or **earnings per share (EPS)**. Regrettably, this is a key accounting parameter that is also very easy to manipulate. This practice of massaging EPS is called "window dressing", or improving the presentation of the accounts by adjusting exceptional items, provisions, etc. The growing emphasis on operating profit or EBITDA represents an improvement because it considerably reduces the impact of exceptional items or non-cash expenses.

The second-generation accounting indicators appeared as investors began to reason in terms of **profitability**, i.e. **efficiency**, by comparing return with the equity used. This ratio is called *return on equity*, or **ROE**. However, it is possible to leverage this value as well, since a company can boost its ROE by skilfully raising its debt level. Even though ROE might look more attractive, no "real" value has been created since the increased profitability is cancelled out by higher risk not reflected in accounting data.

Since the return on capital employed (**ROCE**) indicator avoids this bias, it has tended to become the main measure of economic performance. Only in a few sectors of activity is it meaningless to use ROCE (such as in banking or insurance). In those industries, return on equity is still widely used.

While NPV and other economic indicators represent valuable tools for strategic analysis and a good basis for estimating the market value of companies, they are based on projections that are frequently difficult to assess. Unfortunately the cash flow for one single year is easy to manipulate and meaningless. Indeed, it is not intuitively interpretable. At the same time, we know that the major drivers of cash flows are the *growth of earnings and revenues* of the company and ROCE. By focusing attention on ROCE, there is a better intuitive grasp of how the company is performing. It is then easier to assess the firm's growth both over time and relative to its industry.

➤ **Economic indicators** emerged with the realisation that profitability *per se* cannot fully measure value because it does not factor in risks. To measure value, returns must also be compared with the cost of capital employed. Using the cost of financing a company called the weighted average cost of capital, or WACC,[1] it is possible to assess whether value has been created (i.e. when return on capital employed is higher than the cost of capital employed) or destroyed (i.e. when return on capital employed is lower than the cost of capital employed).

1 *See Chapter 23.*

However, some companies restrict their disclosures to just this ratio. For example, before its merger with GDF, the objective of the French company, Suez, was to realise a return on capital employed that was at least 3% higher than its cost of capital. But companies can also go one step further by applying the calculation to capital employed at the beginning of the year in order to measure the value created

over the period. The difference can then be expressed in currency units rather than as a percentage. This popular measure of value creation has been most notably developed in the **EVA**, or *Economic Value Added*, model. It is also known as **economic profit**.

Yet the best of all indicators is undoubtedly *Net Present Value* (see **NPV**, Chapter 16), which provides the exact measure of value created. It has been repeatedly demonstrated that intrinsic value creation is the principal driver of *companies' market value*. But NPV has one drawback because it must be computed over several periods. For the external analyst who does not have access to all the necessary information, the NPV criterion becomes difficult to handle. The quick and easy solution is to use the above-mentioned ratios. It is important to remember that while the other ratios are simpler to use, they are also less precise and may prove misleading when not used with care.

➤ **Market indicators:** *Market Value Added* (**MVA**) and *Total Shareholder Return* (**TSR**) are highly sensitive to the stock market. MVA represents the difference between the value of equity and net debt, and the book value of capital employed. It is expressed in currency units. TSR is expressed as a percentage and corresponds to the addition of the return on the share (dividends/value of the share) and the capital gains rate (capital gains during the period divided by the initial share value). It is the return earned by a shareholder who bought the share at the beginning of a period, earned dividends, and then sold the share at the end of the period.

A major weakness with these two measures is that they may show destruction in value because of declining investor expectations about future profits, even though the company's return on capital employed is higher than its cost of capital. This happened to Bic, which saw its share price halved from 1998 to 2004. However, during this time its ROCE was consistently above 10% per year whereas its cost of capital was only about 8.5%. Conversely, in a bull market a company with mediocre economic performances may have flattering TSR and MVA. In the long term, these highs and lows are smoothed out and TSR and MVA eventually reflect the company's modest performances. Yet in the meantime, there may be some major divergences between these indicators and company performance.

These considerations prompted some stock exchange authorities to recommend making a clear distinction between economic indicators and measures of stock market value creation. (TSR and MVA). The former measure the past year's performance, and the latter tend to reflect anticipations of future value creation. The measures of stock market value creation take into account the share price, which reflects these anticipations. Yet the different measures of economic performance and stock market value are complementary, rather than contradictory.

➤ Aside from accounting, economic and market indicators, companies frequently adopt a fourth category of performance variables known as **value drivers**. These are measured with a class of associated metrics called **key performance indicators (KPIs)**.

Value drivers are at the root of business performance because they are frequently **leading indicators** of performance, while financial results (such as ROCE, for example) are lagging indicators. Management has a strong need to understand where

their company is going in the future. KPIs can be either *operating* or *strategic* measures, for example in:

○ pharmaceutical companies ⇒ value driver: R&D pipeline;
○ packaged food division ⇒ market share; and
○ retailers ⇒ number of stores opened in a given year or number of new product categories introduced.

Practitioners often undertake value driver analysis by breaking down ROCE into its elementary financial components (EBIT, capital employed). Although this is a good starting point, the "real" value drivers can be found by further disaggregating the factors that drive each kind of revenue and costs. This in turn allows for analysing concrete improvement actions.[2]

While it is worthwhile to mention value drivers at this juncture, the rest of this chapter will continue to focus on accounting, economic and market criteria. The reasons for leaving behind the discussion of value drivers are:

○ value drivers are highly company- and industry-specific. They are also innumerable. It would be highly impractical to try and dedicate appropriate attention to all of them here; and
○ value drivers are normally identified and adopted on a business-unit by business-unit basis. The scope of this text is more concerned with detailed examinations of corporate and company-wide measures at a higher level.

2 For example, retailers of durable goods may break down the cost-side of EBIT margin into trip per transactions, cost per trip *and* number of transactions.

Section 19.1
ACCOUNTING CRITERIA

Certain accounting indicators, like net profit, shareholders' equity, and cash flow from operations, are more representative of a firm's financial strength. However, they are flawed and not appropriate for the purposes of financial analysis, mainly because:

● accounting items can be manipulated;
● they may not consider the time value of money and the opportunity cost of capital.

The same could be said of the criteria presented next in this section – Earnings per Share (**EPS)**, the Accounting Rate of Return, and Equity per Share. However, they are systematically used as analytical criteria for all financial decisions, even at the board level.

Even so, are they really of any practical use?

Although EPS, the accounting rate of return, and equity per share are primarily of an accounting nature and generally tend to ignore risks, they do have some merit and can impart useful information.

However it is inappropriate to believe that by artificially boosting them you have created value. Nor is it correct to assume that there is a constant and automatic link between improving these criteria and creating value. In order to maximise value, it is simply not enough to maximise these ratios, even if they are linked by a coefficient to value or the required rate of return.

1/ EARNINGS PER SHARE

Notwithstanding the comments just made about earnings per share (EPS), many financial managers continue to favour using it. Despite its limitations, it is still the most widespread multiple because it is directly connected to the share price via the price-earnings ratio. EPS' popularity is rooted in three misconceptions:

- the belief that earnings per share factors in the cost of equity and therefore, the cost of risk;
- the belief that accounting data influence the value of the company. Changing accounting methods (for inventories, depreciation, goodwill, etc.) will not modify the company's value, even if it does change earnings per share; and
- the belief that any financial decision that lifts EPS will change value as well. This would imply that the P/E ratio[3] remains the same before and after the financial decision, which is frequently not the case. Thus, value is not a direct multiple of earnings per share, because the decision may affect investors' assessment of the company's risks and growth potential.

3 *The P/E ratio is equal to Price/earnings per share. It measures the relative dearness of a share.*

Consider Company A which, based upon its risks, and growth and profitability prospects, has a P/E ratio of 20. Its net profit is 50. Company B has equity of 450 with net profit of 30, giving it a P/E of 15. Company A decides to acquire a controlling interest in Company B, paying a premium of 33% on B's value, i.e. a total of 600. Company A finances the acquisition entirely by taking on debt at an after-tax cost of 3%. Both Companies A and B are fairly valued with regards to their risk exposure. There are no industrial or commercial synergies that could increase the new group's earnings, and no goodwill.

Company A's net profit is thus:

	Former net profit of A:	50
+	net profit of B:	30
−	cost of financing:	$18 = 600 \times 3\%$
=	New net profit of A:	62, or $+ 24\%$

Since A financed its acquisition of B entirely through debt, it still has the same number of shares. The increase in earnings per share is therefore equal to that in net profit, that is, 24%. This certainly seems like an extraordinary result! But has A really created value by buying B? The answer is no, since there are no synergies to speak of between A and B. Keep in mind that A paid 33% more than B's equilibrium price. In fact, Company A has destroyed value in proportion to this premium, i.e. 150, because it cannot be offset by synergies.

In fact, the explanation for the – apparent – paradox of a 24% rise in earnings per share matched by a destruction of value is that **the buyer's EPS has increased, because the P/E of the company bought by means of debt is higher than the after-tax cost of**

the debt. Here, B has a P/E of 20 given the 33% premium paid by A on the acquisition. The inverse of 20 (5%) is much higher than the 3% after-tax cost of the debt for A.

At present low interest rates (4% net of taxes), an acquisition paid in cash must be based on a P/E ratio of more than 25 to have a negative impact on the EPS[4] of the buyer. Such a situation leaves plenty of margin to manoeuvre.

4 *Before amortisation of goodwill.*

Consider now Company C, which has equity of 1400 with net profit of 140, i.e. a P/E of 10. It merges with Company D, which has the same risk exposure, equity of 990 and a P/E of 18 (net profit of 55), with no control premium. Thanks to very strong industrial synergies, C is able to boost D's net profit by 50%. Without doubt, value has been created. And yet, it is not difficult to prove (see Exercise 1) that C's EPS dropped 7% after the merger. This is a mechanical effect due simply to the fact that D's P/E of 18 is higher than C's P/E of 10, because D has better earnings prospects than C.

At the risk of being repetitious, a word of warning about the widespread fallacy that EPS growth equals value creation. This has led to the misconception that, accordingly, EPS dilution means that value has been destroyed. This is a myth. EPS is an accounting metric, not a measure of value.

So, what was the net result of Company C's acquisition of Company D? **The question is not whether Company C's EPS has been enhanced or diluted, but whether it paid too much for D.** In fact, it did not, since there was no control premium paid and industrial synergies were created. After the operation, C's share will trade at a higher P/E, as it should enjoy greater earnings growth thanks to the contribution from D's higher-growth businesses. In the end, the higher P/E ratio should more than compensate for the diluted EPS, lifting the share price. This is only logical considering that the industrial synergies created value.

In fact, EPS can be a reliable indicator of value creation under three conditions only:
- the risk on capital employed remains the same from one period to the next, or before and after operations such as mergers, capital increases or share buy backs, investments, etc.;
- earnings growth remains the same before and after any given operation; and
- the company's financial structure remains the same from one period to the next, or before and after a given operation.

If these three conditions are met, we can assume that EPS growth reflects the creation of value, and EPS dilution the destruction of value.

If just one of these conditions is lacking, there is no way to effectively evaluate EPS. It is not possible to infer that any increase in EPS reflects the creation of value, nor that a decrease is a destruction of value. In our example of a combination between A and B financed by debt, although A's EPS rose 24%, its risk increased sharply. Its position is no longer directly comparable with that before the acquisition of B.

Similarly, C's post-merger EPS cannot be compared with its EPS prior to the merger. While the merger did not change its financial structure, C's growth rate after the merger with D is different from what it was beforehand.

2/ ACCOUNTING RATES OF RETURN

Accounting rates of return comprise:

- Return on equity (**ROE**);
- Return on capital employed (**ROCE**), which was described in Chapter 13; and
- Cash Flow Return on Investment (**CFROI**), the simplified version of which compares EBITDA with gross capital employed, i.e. before amortisation and depreciation of fixed assets.

$$CFROI = \frac{EBITDA}{\text{Capital employed}}$$

This ratio is used particularly in business sectors wherein charges to depreciation do not necessarily reflect the normal deterioration of fixed assets, e.g. in the hotel business.

The main drawback of accounting rates of return on equity or capital employed is precisely that they are accounting measures. As shall be demonstrated below, these have their dangers.

5 *To simplify the discount calculation, we assume that the planned investments will generate a return to in nity.*

Consider[5] Company X, which produces a single product and generates a return of 30% on capital employed amounting to 100. X operates in a highly profitable sector and is considering diversifying. Should it expect the present 30% rate of return to be generated on other possible projects? If it does, X will never diversify because it is unlikely that any other investments will meet these criteria.

How can this problem be rationally approached? The company generates an accounting return of 30%. Suppose its shareholders and investors require a 10% return. Its market value is thus 30/10%, or 300.

The proposed investment amounts to 100 and generates a return of 15% on identical risks. The required rate of return is constant at 10%. We see that:

	Present operating profit	30% × 100 = 30
+	Operating profit on new investment	15% × 100 = 15
=	Total	45

This yields an enterprise value of 45/10% = 450 (+150), with a return on capital employed of 45/200 = 22.5%

The value of the capital employed has increased by more than the amount invested (150 versus 100) because the profitability of Company X's investment is higher than the rate required by its shareholders and investors. Value has been created, and X was right to invest. And yet the return on capital employed fell by 30% to 22.5%, demonstrating that this criterion is not relevant.

In general, if the investment yields more than the required rate of return, the increase in the value of the company will exceed that of the sums invested.

The inverse example is Company Y, which has a return of 5% on capital employed of 100. Assuming the shareholders and investors require a 10% return as well, the value of Y's capital employed is 5/10% = 50.

The proposed investment amounts to 25 and yields a return of 8%. Since we have the same 10% required return, we get:

	Present operating profit	5% × 100 = 5
+	Operating profit of new investment	8% × 25 = 2
=	Total	7

This results in capital employed being valued at $7/10\% = 70(+20)$, with a return of $7/125 = 5.6\%$

The value of Y's capital employed has indeed increased by 20, but this is still less than the increase of 25 in capital invested. Value has been destroyed. The return on the investment is just 8%, whereas the required rate is 10%. The company has lost money and should not have made the investment. And yet the return on capital employed rose from 5% to 5.6%.

Similarly, one could demonstrate that ROE increases after an acquisition funded by a share issue, when the target company's reverse 1/(P/E) is higher than the buyer's current ROE.

Financial managers should approach book rates of return with caution. These ratios are accounting measures, but not external measures. They assume that the company is operating in a closed system! The minimum criterion should be the return required by the financial system.

Setting aside all these accounting concepts (R), what are the implications for the financial concepts (k)?

Unfortunately, investors and corporate managers continue to view decision-making in terms of the impact on accounting measures, even though it has just been demonstrated that these criteria have little to say about the creation of value. True, accounting systems are a company's main source of information. However, financial managers need to focus first and foremost on how financial decisions affect value.

3/ EQUITY PER SHARE

Equity per share is one way of measuring shareholder value. It therefore seems logical to assume that there is a coefficient linking the price of the share with equity per share. This is called the ***Price-to-Book Ratio*** (**PBR**). However, the warnings against the P/E ratio apply to the PBR as well.

Bear in mind that if equity has been correctly valued in the accounts, that is, if it includes unrealised capital gains on assets, the price-to-book ratio will be:

- Lower than 1 if the expected return on equity is lower than the return required by shareholders; and
- Higher than 1 if the expected return is higher than that required by the shareholders.

1/ NET PRESENT VALUE

It should now be clear that the concept of value corresponds perfectly to the measure of **net present value**. Financial management consists of constantly measuring the net present value of an investment, project, company or source of financing. Obviously, one should only allocate resources if the net present value is positive, in other words, if the market value is lower than the present value. **Net present value reflects how allocation of the company's resources has led to the creation or destruction of value.** On the one hand, there is a constant search for anticipated financial flows – while keeping in mind the uncertainty of these forecasts. On the other hand, it is necessary to consider the rate of return (k) required by the investors and shareholders providing the funds.

The value created is thus equal to the difference between the capital employed and its book value. Book value is the amount of funds invested in the company's operations.

Creation of value = enterprise value − book value of capital employed

The creation of value reflects investors' expectations. Typically, this means that, over a certain period, the company will enjoy a rent with a present value allowing its capital employed to be worth more than its book value!

The same principle applies to choosing a source of financing for allocating resources. To do so, one must disregard the book value and determine instead the value of the financial security issued and deduct the required rate of return. This approach represents a shift from the explicit or accounting cost to the **financial cost, which is the return required on this category of security**. By minimising the cost of a source of financing one is actually minimising the overall financial cost.

On its own, the concept of cost may be insufficient when analysing certain very complex products. In such cases, one must resort to the concept of present value. This is particularly true of hybrid securities.

A source of financing is considered cheap **only** if its net present value is negative.

Once again, the only reliable financial criterion is net present value.

2/ ECONOMIC PROFIT OR ECONOMIC VALUE ADDED (EVA)

Economic profit is less ambitious than net present value. It only seeks to measure the wealth created by the company in each financial year. EVA factors in not just the cost of debt, such as in calculating net profit, but it also accounts for the cost of equity.

The innovative aspect of EVA is that it identifies the income level at which value is created. This is because EVA is calculated after deducting the capital charge, i.e. the remuneration of the funds contributed by creditors and shareholders.

Economic profit or EVA first measures the excess of ROCE over the weighted average cost of capital. Then, to determine the value created during the period, the ratio is multiplied by the book value of the **capital employed at the start of the reporting period**. Thus, a company that had an opening book value of capital employed of 100 and an after-tax return on capital employed of 12% with a WACC of only 10% will have earned 2% more than the required rate. It will have created a value of 2 on funds of 100 during the period.

$$EVA = \text{Capital employed} \times (ROCE - WACC)$$
$$EVA = NOPAT - WACC \times \text{Capital employed}$$

Economic profit is related to net present value, because NPV is the sum of the economic profits discounted at the weighed average cost of capital.

$$NPV = \sum_{i=0}^{\infty} \frac{\text{Economic profit}_i}{(1 + \text{weighted average cost of capital})^i} = \sum_{i=0}^{\infty} \frac{EVA_i}{(1 + WACC)^i}$$

Company	EVA 2007 (€m)
Shell	11,865
Novartis	3702
Nestlé	3508
Astra Zeneca	3087
Acelor Mittal	3036
BASF	2783
SAP	1652
ABB	1599
L'Oréal	1404
Fiat	1261
Zara	1022
Vodafone	949
Carrefour	791
Heineken	772
Ericsson	771
Porsche	526
Belgacom	519
Swatch	369
Michelin	365
Italcementi	170
Antena 3	167
Carlsberg	126
Bic	82
Bulgari	66
Easy Jet	(3)
British Airways	(47)
Telecom Italia	(115)
Daimler	(910)

The table shows EVA for some European firms.

To calculate EVA, it is necessary to switch from an accounting to an economic reading of the company. This is done by restating certain items of capital employed as follows:

- The research and development costs expended by the company during the past five to ten years must be capitalised and added to fixed assets if they contributed to the development of the business for more than one year.
- The exceptional losses of previous years must be restated and added to capital employed insofar as they artificially reduce the company's capital.
- The goodwill recorded in the balance sheet must be taken as gross, i.e. corrected for cumulative amortisation, the badwill must be deducted from assets.

Of course, the profit and loss account (operating profit/loss and taxes) must be restated to ensure consistency with the capital employed calculated previously.

The firms that develop economic profit tools for companies generally have a long list of accounting adjustments that attest to their expertise. Such accounting expertise typically represents a barrier to entry for others seeking to perform the same analyses.

EVA's novelty also lies in its scope of application, since it enables a company to measure performance at all levels by applying an individual required rate of return to various units. It is a decentralised financial management tool.

A study by Kleineman, published in the *Journal of Applied Corporate Finance* (JACF) in 1999, reports that US companies adopting EVA during the period 1987–1996 outperformed median firms in the same industry. During the four-year period covered by the study, firms using EVA posted results that were 28.8% better than those that did not.

Conversely, Biddle et al. (1999), examined the claim that EVA, rather than net income, is more closely associated with stock returns and firm value. Yet their evidence indicates that, in fact, EVA does not dominate net income in relationship to stock returns and firm value.

Keep in mind these words of warning about EVA:

- If managers are judged based on EVA they will have a strong incentive to reduce invested capital. However, it can happen that the reduction in the invested capital is purely cosmetic.
- If managers are judged according to the current year's EVA, they will have a bias towards assets-in-place. As a result, they may be induced to abandon high-growth investments. Such behaviour in turn reduces the long-term economic value added that such investments may have otherwise added to the value of the company. A company can be tempted to maximise its EVA for a single year, at the cost of future EVA, by underinvesting or artificially reducing its working capital. In general, it is very difficult to find an annual measure of performance that truly reflects the creation of value. The only real measure of a company's ability to create value in the long term is the net present value of all future flows.
- If management's compensation is based on short-term EVA, managers may sacrifice future growth for current EVA.
- EVA will be overestimated for companies' divisions that are under-allocated capital, and underestimated for those divisions or business units that are over-allocated capital.

- Companies that undertake value-adding projects may end up with a lower value if the new projects increase the operating and financial risk and thus the cost of capital.
- Above all, EVA is an example of successful marketing and communication. Its promoters have taken a financial concept that has been around for a long time and reformulated it in easy-to-understand terms that can be explained at all organisational levels.

In short, we think there are good reasons for agreeing with Damodaran's opinion on EVA: "... economic value added is an approach skewed toward assets-in-place and away from future growth" (Damodaran, 2001, p. 821).

3/ NET PRESENT VALUE AND EVA: A COMPARISON

Economic value added is a throwback to the net present value rule. In fact, it can be demonstrated that the present value of the economic value added by a project over its life is the net present value of the project. In order to achieve this result, the project must have a salvage value of zero, and the present value of depreciation must be equal to the present value of initial investment, discounted back over the project's life. In other words, we must assume that the cash flow from depreciation is really the capital being returned to the firm.

Consider a project with the following characteristics:

1   The project requires an initial investment of I, and has an expected life of n years, at the end of which it is assumed to have a salvage value of SV_n. The project will have depreciation of $Depr_t$ in year t.
2   The project will generate earnings before interest and taxes in year t of $EBIT_t$ and the firm has a marginal tax rate of t.
3   The firm is assumed to have a cost of capital of WACC.

The net present value of this project can be written as follows:

$$NPV = \sum_{t=1}^{n} \frac{EBIT_t (1-t) + Depr_t}{(1 + WACC)^t} + \frac{SV_n}{(1 + WACC)^n} - I$$

This is the standard equation for the NPV of a project with a life of n years, with a salvage value at the end of the project. If we assume that the initial investment I – if invested to earn the cost of capital and its entire value salvaged at the end of the project life – is worth itself, I can be written also as follows:

$$I = \sum_{t=1}^{n} \frac{WACC \times I}{(1 + WACC)^t} + \frac{I}{(1 + WACC)^n}$$

Let's rewrite the two equations, by substituting the I of the second equation in the first:

$$NPV = \sum_{t=1}^{n} \frac{EBIT_t (1-t) + Depr_t}{(1 + WACC)^t} + \frac{SV_n}{(1 + WACC)^n} - \sum_{t=1}^{n} \frac{WACC \times I}{(1 + WACC)^t}$$
$$- \frac{I}{(1 + WACC)^n}$$

Let us also assume that:

1. the operating project has no salvage value;
2. the PV of depreciation is equal to the present value of initial investment (discounted back over the project life). In other words, the cash flow from depreciation is exactly the capital being returned to the firm.

The present value of the project can thus be simplified as follows:

$$NPV = \sum_{t=1}^{n} \frac{EBIT_t (1-t)}{(1+WACC)^t} - \sum_{t=1}^{n} \frac{WACC \times I}{(1+WACC)^t}$$

Knowing that ROCE $= EBIT \times (1-t)/I$ we finally get:

$$NPV = \sum_{t=1}^{n} \frac{(ROCE - WACC) \times I}{(1+WACC)^t} = \sum_{t=1}^{n} \frac{EVA}{(1+WACC)^t}$$

Note, however, that when the salvage value is large and/or the present value of depreciation tax benefits is greater or lesser than the present value of the capital invested, the present value of economic value added will not yield the correct net present value for the project.

Assume, for example, a project that requires an initial investment of €100. The project is depreciated over 4 years (straight line method) and generates after-tax operating cash flows of €50 per year for 4 years. No additional investments in fixed assets or working capital are required after the initial investment. The cost of capital is 10%. The tables below show the NPV of free cash flows and the present value of EVAs associated with this project.

Year	0	1	2	3	4
Net present value of cash flows					
Initial investment	−100				
After-tax operating cash flows	0	50	50	50	50
Free cash flows	−100	50	50	50	50
Pv FCF @ 10%	−100	45.5	41.3	37.6	34.2
NPV	**58.5**				
Present value of EVA					
After-tax operating cash flows	0	50	50	50	50
Less: Depreciation		25	25	25	25
NOPAT		**25**	**25**	**25**	**25**
Beginning capital employed	−100	−75	−50	−25	0
Capital charge (@10%)		**−10**	**−7.5**	**−5**	**−2.5**
EVA		15	17.5	20	22.5
PV yearly EVA at 10%		13.6	14.5	15	15.4
Present value of EVAs	**58.5**				

The results under the two alternative methodologies are exactly the same. Under the NPV analysis, the charge for the initial investment is recognised at the beginning of the period. Under EVA, the initial investment is recognised over time through two charges: the depreciation (that reduces NOPAT) and the capital charge (based on the undepreciated investment at the beginning of each period). The **present value** of the sum of these two charges (depreciation and capital charge) is always equal to the initial investment outflow.

4/ CASH FLOW RETURN ON INVESTMENT (CFROI)

The original version of cash flow return on investment (CFROI) corresponds to the average of the internal rates of return on the company's existing investments. It measures the IRR earned by a firm's existing projects.

CFROI is the internal rate of return and it is equal to:

1 the company's *gross* capital employed (GCE), i.e. before depreciation and adjusted for inflation. GCE is computed by adding depreciation back to the book value of the assets to arrive at an estimate of the original investment in the assets. The gross investment must then be converted into current value by reflecting the inflation incurred since the asset was purchased; *and*

2 the ***current* year EBIT**$\times$**(1 − Tax rate) + Depreciation and amortisation**. We define this measure as Gross Cash Flow (GCF). GCF is then considered as an annuity with the same length as the expected life of the assets (N); *and*

3 the expected value of the assets at the end of their life, in current values. This is defined as the **SV** (Salvage Value).

Analytically, CFROI is the result of:

$$GCF(PV \text{ of an annuity}, N \text{ years}, CFROI) + SV/(1 + CFROI) - GCE = 0$$

CFROI is then compared with the weighted average cost of capital. If CFROI is higher than WACC, the company is creating value; if it is lower, then the firm is destroying value.

There are two major differences between the CFROI and the "traditional" IRR:

1 the internal rate of return is based on incremental *future* cash flows. Conversely, the CFROI reconstructs an asset using both cash flows that have already occurred and cash flows that are yet to occur.

2 CFROI holds gross cash flows constant over a project's life and considers them as an annuity with a length of N years and a rate equal to CFROI. IRR does not assume that after-tax cash flows are constant over time.

The CFROI is complex to calculate, and even more difficult to explain than ROCE to non-financial managers. As with EVA, the series of accounting adjustments required to calculate CFROI seem designed to convince users to call on the services of its creators, in this case the Holt firm, to implement the system. As a result, a simplified version of CFROI is frequently used, one which is more of an accounting measure than a financial one.

In general, there can be relevant differences between ROCE and CFROI when companies have:

● very long-lived fixed assets;
● a high incidence of fixed assets vs. working capital;

- very old or very new fixed assets; and/or
- irregular capital expenditure patterns.

However, it is possible to demonstrate that an increase in CFROI does not necessarily indicate a higher value of the firm because such a result may have come at the expense of lower growth and higher risk.

Section 19.3
MARKET CRITERIA

1/ CREATING STOCK MARKET VALUE (MARKET VALUE ADDED)

For listed companies, *Market Value Added (MVA)* is equal to:

> **MVA = market capitalisation + net debt − book value of capital employed**

In most cases, if no other information is available, we assume that net debt corresponds to its book value. Thus, the equation becomes simpler:

6 The market-to-capital ratio is a variation of MVA expressed as a ratio rather than a unit amount, because it is obtained by dividing the market capitalisation of debt and equity by the amount of capital invested.

> **Value created = Market capitalisation + Book value of net debt**
> **− (Book value of equity + Book value of debt)**
> **= Market capitalisation − Book value of equity**

So, market value added is frequently considered to be the difference between market capitalisation and the book value of equity. This is the equivalent of the price-to-book ratio (PBR) discussed in Chapter 27.[6]

The table shows MVA for some big listed European companies as of May 2008

Company	MVA (€m)	Company	MVA (€m)
Royal Dutch Shell	79,201	Adidas	5,670
Total	76,041	M6	1,138
Telefoncia	66,756	Bonduelle	257
Nokia	52,901	Club Med	222
ABB	41,903	Boursorama	83
France Télécom	23,574	Easy Jet	78
Sanofi	18,087	NRJ	21
Maroc Télécom	14,969	Thomson	−395
Porsche	13,468	Natixis	−3,594
Ericsson	11,979	Crédit Agricole	−9,248
Fiat	7,884	Royal Bank of Scotland	−45,506

Inversely, MVA can raise measurement problems due to the use of accounting data.

It is easy to demonstrate the relationship between market value added and intrinsic value creation in equilibrium markets, since:

$$\text{Market value added} = \sum_{t=0}^{\infty} \frac{\text{Economic profit}_t}{(1 + WACC)^t}$$

Economic Profit being equal to Capital Employed $\times$ (ROCE $-$ WACC). This is also equivalent to:

$$\text{Enterprise value} = \text{Book value of assets} + \sum_{t=0}^{\infty} \frac{\text{Economic profit}_t}{(1 + WACC)^t}$$

However, those who do not believe in market efficiency contend that MVA is flawed because it is based on market values that are often volatile and out of the management's control. Yet this volatility is an inescapable fact for all, as that is how the markets function.

2/ TOTAL SHAREHOLDER RETURN (TSR)

TSR is the return received by the shareholder who bought the share at the beginning of a period, earned dividends (which are generally assumed to have been reinvested in new shares), and values his portfolio with the last share price at the end of the period. In other words, TSR equals (share appreciation + dividends)/price at the beginning of the period.

In order for it to be meaningful, the TSR ratio is calculated on a yearly basis over a fairly long period of, say, 5–10 years. This smoothes out the impact of erratic market movements, e.g. the tech, media and telecom stock bubble of 2000.

Below is a table of the total shareholder returns of several large European groups over the 1994–2008 period:

Company	TSR %
Nokia	60.7
Ericsson	29.8
Telefónica	26.0
RBS	23.4
BBVA	23.2
Vodafone	22.3
Santander	21.2
EON	19.5
ING	19.4
Siemens	18.8
HSBC	18.2
Total	18.1
ENI	17.8
Crédit Suisse	17.5
Roche	16.1
BP	15.6
UBS	15.3
Société Générale	15.2
Deutsche Telekom	14.5
Nestlé	14.3
Shell	14.1
BNP Paribas	13.9
Glaxosmithkline	11.1
Novartis	2.1

Since markets are not always in equilibrium, there may be times when the creation of both intrinsic value and market value are not automatically correlated. This is particularly true during bust (or boom) periods, when a company may earn more than the cost of its capital and yet still see the market value of its capital employed collapse.

Section 19.4
PUTTING THINGS INTO PERSPECTIVE

1/ STRENGTHS AND WEAKNESSES OF FINANCIAL INDICATORS

As long as performance measures and their implementation remain so diversified, it is vital to have a good understanding of their respective flaws. By choosing one or another measure, companies can present their results in a more or less flattering light. Financial managers typically choose those measures that will demonstrate the creation, rather than the destruction of value.

2/ CREATING VALUE OR VALUES?

Over the past 15 years, the concept of value creation has spread rapidly, to the point where no corporate communication can afford to disregard it. Increasingly, value is assessed not

Ratio	Economic criteria			Market criteria		Accounting criteria		
	Net present value	Economic profit	Cash flow return on investment	Market value added	Total shareholder return	Earning per Share	Accounting rates of return	Equity per share
Acronym	NPV	EVA	CFROI	MVA	TSR	EPS	ROE, ROCE	
Strengths	The best criterion	Simple indicator leading to the concept of weighted average cost of capital	Not restricted to just one year.	Astoundingly simple. Reflects the total rather than annual value created.	Represents shareholder return in the medium to long term	Historical data. Simple.	Simple concepts.	
Weaknesses	Difficult to calculate for an external analyst	Restricted to one year. Difficult to evaluate changes over a period of time.	Complex calculations.	Subject to market volatility. Difficult to apply to unlisted companies.	Calculated over too short a period. Subject to market volatility.	Does not factor in risks. Easily manipulated. Does not factor in the cost of equity.	Accounting measures, thus does not factor in risks. Restricted to one year. To be significant, must be compared with the required rate of returns.	Little connection with value creation.

just as it pertains to shareholders, but to all the stakeholders in the company: shareholders, employees and clients alike.

Managers now talk of stakeholder value, customer capital, and human capital just as they do of financial capital.

While these concepts are certainly very appealing, we believe they are rooted in two misconceptions:

1   The creation of value is sometimes rather hastily accused of leading to layoffs, plant closures, drastic cost reductions or disregard for environmental protection, labour law and human dignity. In fact, the opposite is true! A look at groups that have created sustainable value for their shareholders, frequently over long periods, shows that these same companies are at the forefront of innovation, constantly creating new markets, meeting new needs, hiring and training employees, and inspiring loyalty and strong customer relationships. Just a few examples are l'Oréal, General Electric, Sony, Nokia, Nestlé and BMW. Cost-cutting strategies can only be temporary and they cannot durably create shareholder value. Cost-cutting only works in the short-term and only if it gives rise to a strategy of profitable growth.

2   Shareholders entrust their money to managers whose task is to multiply it. Financial directors must operate within the framework of a given corporate mission and with the shareholders' best interests in mind. When managers pursue other objectives, they betray the basic tenet upon which this pact is founded. More importantly, they are sure to fall short of all their objectives.

We believe the words of **Milton Friedman** (1970) are still valid: "In a free-enterprise, private-property system, a corporate executive is an employee of the owners of the business. He has direct responsibility to his employers. That responsibility is to conduct the business in accordance with their desires, which generally will be to make as much money as possible while conforming to the basic rules of the society, both those embodied in law and those embodied in ethical custom. Of course, in some cases his employers may have a different objective. A group of persons might establish a corporation for an eleemosynary purpose – for example, a hospital or a school. The manager of such a corporation will not have money profit as his objective but the rendering of certain services. In either case, the key point is that, in his capacity as a corporate executive, the manager is the agent of the individuals who own the corporation or establish the eleemosynary institution, and his primary responsibility is to them."

Only by creating sustainable value can a company ensure that it has the means to finance growth, train and pay its employees properly, produce quality goods or services, and respect the environment.

Fortunately, there is more to life than finance. Yet in finance, there is just one overriding objective – creating value – and only by meeting this objective can one achieve all the others.

SUMMARY

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The tools used for measuring creation of value can be classified under three headings:

- **Economic tools**, which yield the best results since they factor in returns required by investors (the weighted average cost of capital) and do not depend directly on the sometimes erratic price movements of markets. NPV is the most important of these. EVA, the popular term for economic profit, measures how much the shareholder has increased his wealth over and above standard remuneration. However, EVA has the drawback of being restricted to the financial period in question, EVA can thus be manipulated to yield maximum results in one period at the expense of subsequent periods.

- **Market tools**, which measure MVA (Market Value Added), or the difference between the company's enterprise value and, its book value, and TSR (Total Shareholder Returns). TSR is the rate of shareholder returns given the increase in the value of the share and the dividends paid out. These market tools are only useful over the medium term, because to be meaningful they should avoid the market fluctuations that can distort economic reality.

- **Accounting indicators,** which have the main drawback of being designed for accounting purposes, i.e. they do not factor in risk or return on equity. They include earnings per share (EPS) linked to the value of the share by the price earnings ratio (P/E), shareholders' equity linked to the value of the share by the price book ratio (PBR), accounting profitability indicators (shareholders' equity, return on equity (ROE), return on capital employed (ROCE)) to be compared with the cost of equity (or the weighted average cost of capital, WACC).

A thorough understanding of the weaknesses of all of these tools is vital. Given the lack of a generally accepted standard measure for value creation, companies quite naturally rely on those criteria that show them off in the best light.

QUESTIONS

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quiz

Questions

1/What is the main drawback of accounting profitability indicators?

2/Why do EVA adversaries describe it as a great marketing stunt?

3/What is a TSR calculated over one year?

4/Will a company that is making losses record positive economic profits or EVA?

5/Can a company with a positive net profit show a negative economic profit?

6/What is the sum of future EVA discounted to the cost of capital equal to?

7/Subject to what conditions is it possible to compare EPS before and after a deal?

8/What is your view of this quotation: "A series of positive EVA can only be a sign of two things: either of a monopoly that is more or less temporary (for example a high tech development) or a poor estimation of the cost of capital"?

9/Is a drop in return on equity synonymous with value destruction? Why?

10/Is a drop in return on capital employed (ROCE) synonymous with a value destruction? Why?

11/Can a company create value and have a negative TSR over one year? And over 10 years?

12/What does TSR correspond to in terms of investment choice?

13/If you were stranded on a deserted island with only one criterion for measuring value creation, which would you want to use? Why?

14/If EPS drops after a deal, does this necessarily imply value destruction?

15/If EPS rises after a deal, does this necessarily imply value creation?

16/Why does an accurate calculation of EVA or profitability mean that the balance sheet will have to be restated?

17/What is the drawback of company rankings based on EVA?

18/Do layoffs systematically lead to value creation?

19/Can value be created by developing new products and new markets or by reducing costs?

20/The hotel chain CIGA provides information to the market on value creation, measured by a ROCE calculated as the ratio between EBITDA and the historic value (i.e. gross before depreciation and amortisation) of capital employed. State your views.

21/The group Lagardère states in its annual report that "the rate used to measure the cost of capital is the discount rate which is equal to the flow of net future dividends (excluding tax credits) at the average share price". State your views. What assumption must be made for this statement to be true?

Exercises

1/ Show that in the example on p. 349, C's EPS drops by 7% after the company merges with D.

2/ Use the figures provided in Section 1 (Chapters 4 and 9) and calculate the EVA and the MVA of Indesit in 2007. The weighted average cost of capital of Indesit is 10% and it has a market capitalisation of €830m. Suppose tax rate is 37%.

Questions

1/ The very fact that they are accounting indicators and not part of the realm of value, since they do not factor in risk or the cost of equity.

2/ Take a concept that has existed for years, give it a new trendy name and the full media treatment and you've got EVA.

3/ Intellectual trickery! TSR only means something if it is calculated over at least five years in order to eliminate extreme market movements.

4/ No, because since it is making losses, it does not cover the cost of equity.

5/ Yes, if net profits do not cover the cost of equity.

6/ To NPV.

7/ Subject to the risk of capital employed, the capital structure and the growth rate remaining the same before and after the operation.

8/ It is quite true given the pressure from the competition.

9/ Not necessarily if there is a simultaneous drop in risk (capital employed, capital structure) and an improvement in growth prospects. If, not, then yes.

10/ Same answer as for question 9 above.

11/ Over one year, yes. Much less likely over 10 years, since sudden fluctuations in prices that are not linked to the company's economic performance are set off against each other.

12/ The internal rate of return (IRR).

13/ Net present value, which is the best criterion.

14/ Not necessarily, if the growth rate after the deal is higher than before or if the risk related to capital structure and capital employed is reduced. If, not, then yes.

15/ Not necessarily, if the growth rate after the deal is lower than before or if the risk related to capital structure and capital employed is increased. If, not, then yes.

16/ In order to get away from the formal constraints of accounting which are heavily influenced by the principle of conservatism and to think more in terms of economic value.

17/ It focuses on an annual indicator and does not factor in an investment policy which could take over a year to yield results.

18/ No, on the contrary, the creation of value is built on the development of new products and new markets, which leads to an increase in headcount.

19/ In theory, by creating new products and markets, because the sky is the limit! Reducing costs is less effective as all possible cost cutting options are soon exhausted.

20/ ROCE is usually calculated on the basis of operating profit/capital employed (in net book value, i.e. after depreciation and amortisation). CIGA calculates the numerator and the denominator after depreciation and amortisation, which is explained by the highly asset-based nature of its activity – a hotel is not written down economically even if it has been fully amortised.

21/ Equalising the flow of dividends and share prices does not give the cost of capital but the cost of equity. That said, in the case of XYZ, a group which carries no debt, the two are equal.

Exercises

1/ Profits rise from 140 to $140 + 55 + 27.5 = 222.5$, or a multiplication by $222.5/140 = 1.59$. The number of C's shares increases by $990/1400 = 70.7\%$, since D is paid in C's shares, or a multiplication by 1.707. EPS is multiplied by $1.59/1.707 = 93\%$, or a drop of 7%.

2/*EVA 2007 = 2007 operating profit × (1 − tax rate) − capital employed × 10% = 224 × (1 − 37%) − 1160 × 810% = €25m. MVA 2007 = 830 − 636 = €194m*

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